

### **REMARKS**

Claims 2-27 are present in the application. In view of the remarks that follow, Applicants respectfully request reconsideration.

#### **No Rule 132 Affidavit Filed**

In Section 14 on pages 20-21 of the Office Action, the Examiner asserts that Applicants filed an affidavit under 37 C.F.R. §1.132 on November 19, 2009. The Examiner then asserts that he considered the Rule 132 affidavit, but that the affidavit was not persuasive. However, Applicants did not file any Rule 132 affidavit.

#### **Independent Claim 15 - Fukami**

Independent Claim 15 stands rejected under 35 U.S.C. §102 as anticipated by Fukami PCT Publication No. WO99/49504. This ground of rejection is respectfully traversed. Quoting relevant case law, the PTO explains in MPEP §2131 that, under 35 U.S.C. §102:

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). . . . "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim . . . . *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

In other words, to anticipate a claim under §102, a reference (1) must disclose each and every element recited in the claim, and (2) must also disclose these elements arranged in the manner recited in the claim. Applicants' Claim 15 includes a recitation of:

means for providing the first fluid containing no  
surfactant; . . . and  
means for providing a surfactant to the first fluid to form a  
second fluid to reduce an adherence of floating defects to the wafer  
or the objective lens.

Figures 2 and 3 of Fukami disclose a liquid supply apparatus 5 that can supply an immersion liquid 7 to an immersion lithography region through four conduits 21, 22, 27 and 28. For example, see lines 31-37 on page 19 of the machine-generated English translation of Fukami submitted with Applicants' last Response. With reference to lines 1-2 on page 18 of this translation, Fukami explains that "pure water is used as liquid 7".

In explaining the §102 rejection of Claim 15, the Examiner asserts that the claimed "means for providing the first fluid" is a "primary supply reservoir" that is met by a reservoir shown at 5 in Figure 2 of Fukami, and asserts that the claimed "means for providing a surfactant to the first fluid" is a "secondary supply reservoir" that is met by a different reservoir shown at 5 in Figure 3 of Fukami. But contrary to the assertions of the Examiner, Figures 2 and 3 of Fukami do not show two different reservoirs that each happen to have reference numeral 5. Instead, the apparatus shown at 5 in Figure 2 of Fukami is identically the same apparatus that is shown at 5 in Figure 3 of Fukami. Consequently, the Examiner's interpretation of Fukami is not correct, and Fukami does not anticipate Claim 15 under §102 in the manner proposed by the Examiner.

Further, in regard to the recitation in Applicants' Claim 15 of "means for providing a surfactant to the first fluid to form a second fluid", it is respectfully submitted that Fukami fails

to disclose any comparable structure. In this regard, the Examiner never identifies any surfactant in Fukami, and never identifies any structure in Fukami that actually provides a surfactant to any fluid. The informal machine translation of Fukami mentions replacing a dirty lens, but does not appear to contain any mention of the use of any surfactant, or any cleaning liquid. Therefore, and contrary to the assertions in the Office Action, it is respectfully submitted that Fukami does not disclose each and every element recited in Claim 15, and therefore does not meet the requirements for anticipation under §102 that are set forth in MPEP §2131. Consequently, Claim 15 is believed to be allowable over Fukami, and notice to that effect is respectfully requested.

In addition, the Examiner improperly interprets the "means" limitations in Claim 15. MPEP §2182 explains that examination of a means-plus-function limitation must involve the following "two-step" analysis:

1. In the first step, the Examiner must show that the prior art reference performs identically the same function that is specified in the means-plus-function limitation.
2. If and only if the requirement in the first step is met, then in the second step the Examiner looks to the specification and identifies all structure corresponding to that function, and then must show that the prior art structure or step is identical or equivalent to the structure, material, or acts described in the specification.

The Examiner does not actually do this two-step analysis. Instead, in explaining the §102 rejection of Claim 15 in the Office Action, the Examiner completely skips the first step. For example, as noted above, Claim 15 calls for "means for providing a surfactant to the first fluid". Under the first step of the analysis, the Examiner must show Fukami has structure that performs exactly this recited function. However, the Examiner fails to make this required showing. As a practical matter, it is not possible to actually make this particular showing, because Fukami does not appear to disclose any structure that performs exactly this recited function. The informal

English translation of Fukami mentions replacing a dirty lens, but does not appear to mention the use of any surfactant, or any cleaning liquid. Accordingly, it is respectfully submitted that the §102 rejection of Claim 15 is not complete and is thus defective, and it is respectfully submitted that the §102 rejection must be withdrawn.

Moreover, after ignoring the first step of the two-step analysis, the Examiner attempts to perform only the second step. In particular, the Examiner takes each "means" limitation from Claim 15, and replaces it with structural language formulated by the Examiner, thereby effectively producing a completely rewritten version of Claim 15. The Examiner then asserts that this rewritten claim is anticipated by Fukami. However, the rewritten claim is significantly different from Applicants' Claim 15. For example, the Examiner takes Applicants' recited "means for providing a surfactant to the first fluid", and asserts that this is nothing more than "a secondary supply reservoir". However, a secondary supply reservoir is not capable by itself of actually carrying out the recited function of "providing a surfactant to the first fluid". Ultimately, by skipping the first step of the two-step analysis, and by improperly carrying out the second step, the Examiner manages to completely and improperly ignore certain distinctive language that is expressly recited in Claim 15. However, if this distinctive language is properly taken into account, in the manner required by the MPEP, it clearly distinguishes Claim 15 from Fukami.

For each of the reasons discussed above, it is respectfully submitted that independent Claim 15 of the present application is not anticipated under §102 by the indicated portions of Fukami. Accordingly, Claim 15 is believed to be allowable, and notice to that effect is respectfully requested.

#### Independent Claim 15 - Deng and Hazelton

Independent Claim 15 stands rejected under 35 U.S.C. §103 as obvious in view of a proposed combination of Deng U.S. Patent Application Publication No. 2005/0164502 and Hazelton '185. This ground of rejection is respectfully traversed. In this regard, the PTO specifies in MPEP §2142 that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Deng and Hazelton '185 fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 15, for reasons discussed below.

On page 11 of the Office Action, the Examiner admits that Deng does not disclose the recited "means for providing a surfactant to the first fluid to form a second fluid to reduce an adherence of floating defects to the wafer or the objective lens". The Examiner therefore turns to Hazelton '185. In lines 15-19 on page 11, the Examiner asserts that Hazelton '185 discloses in Figure 10:

... the pipe on top of a valve #25 ... which is fully capable of providing a surfactant to the immersion liquid to reduce an adherence of floating defect to the wafer or the optical element.

However, Applicants respectfully traverse the Examiner's interpretation of Hazelton '185. As discussed above, MPEP §2182 specifies that, when analyzing a means-plus-function limitation, the Examiner must show that the structure in the reference actually performs identically the same function that is recited in the means limitation. But in the present situation, there is no identity of function, because the indicated structure in Hazelton '185 does not actually perform Applicants' recited function of "providing a surfactant to the first fluid", or Applicants' recited function of reducing "an adherence of floating defects to the wafer or the objective lens".

More specifically, as to "providing a surfactant to the first fluid", the Examiner asserts that the pipe on top of valve 25 in Figure 10 of Hazelton '185 is "capable of" performing this

function. However, that is not the issue. To make the required showing of identity of function, the Examiner must show that Hazelton '185 specifically teaches performing exactly this recited function. But the indicated portion of Hazelton '185 does not teach structure that performs exactly this function. To the contrary, and focusing on function, Hazelton '185 teaches that separate and distinct fluids are used (1) for immersion lithography and (2) for cleaning. For example, the abstract of Hazelton '185 discusses both an "immersion liquid" and a "cleaning liquid", explaining that:

. . . a fluid-supplying device serves to supply an immersion liquid into this gap such that the supplied immersion liquid contacts both the optical element and the workpiece during an immersion lithography process. A cleaning device is incorporated for removing absorbed liquid from the optical element during a cleanup process. The cleaning device may make use of a cleaning liquid having affinity to the absorbed liquid . . . . The cleaning liquid may be supplied through the same fluid-applying device provided with a switching device such as a valve.

Moreover, in regard to Figure 10, Hazelton '185 explains in paragraph [044] that:

[0044] FIG. 10 shows a different approach to the problem of cleaning the last-stage optical element 4 by applying a cleaning liquid on its bottom surface by using the same source nozzles 21 used for supplying the immersion liquid 7. For this purpose, a switch valve 25 is inserted between the supply nozzle 21 and the liquid unit 5 such that the immersion liquid 7 and the cleaning liquid can be supplied selectively through the supply nozzle 21.

Hazelton '185 teaches that the cleaning fluid has an "affinity" for the immersion fluid, and can thus draw the immersion fluid out of an optical component such as an immersion lens. But contrary to the assertions of the Examiner, Hazelton '185 does **not** teach that the cleaning fluid is mixed with the immersion fluid. In fact, if Hazelton's cleaning fluid and immersion fluid were mixed in the manner proposed by the Examiner, the affinity of the cleaning fluid for the immersion fluid would be used up by the immersion fluid present in the mixture. As a result, the cleaning fluid would not have any remaining affinity that could later draw immersion fluid out of an optical component. In other words, if Hazelton's cleaning fluid and immersion fluid were mixed in the manner proposed by the Examiner, the mixture would ruin the capability of the cleaning fluid to perform its intended purpose of cleaning optical components. Hazelton would clearly have no use for a cleaning fluid that was not capable of fulfilling its intended purpose of drawing immersion fluid out of an optical component. Hazelton's cleaning liquid can only do its job if it is used completely separately from the immersion liquid. Therefore, and contrary to the assertions in the Office Action, Hazelton would never mix his cleaning liquid with his immersion liquid. This is why the indicated portions of Hazelton never mention any such mixture, because it would render Hazelton's cleaning liquid inoperative and thus unsatisfactory for its intended purpose. Therefore, Hazelton '185 does not actually disclose the teaching for which the Examiner cites Hazelton.

A further consideration is that Claim 15 recites providing a surfactant to the first fluid to form "a second fluid to reduce an adherence of floating defects to the wafer or the objective lens", whereas Hazelton's system does not perform this specific function. The cleaning liquid disclosed in Hazelton '185 is different from the surfactant-containing fluid recited in Claim 15. Hazelton '185 teaches a cleaning liquid that attracts the immersion liquid, and that can extract the immersion liquid from a lens. That is, the cleaning liquid in Hazelton is specifically designed to attract the immersion liquid, rather than to reduce adherence of floating defects to the wafer or lens. The indicated portion of Hazelton '185 does not contain any teaching that the cleaning

liquid in Hazelton '185 is capable of reducing the adherence of floating defects to a wafer or a lens. Thus, the cleaning liquid in Hazelton '185 is different in composition and function from the surfactant-containing fluid recited in Claim 15.

For the reasons discussed above, it is respectfully submitted that independent Claim 15 of the present application is not rendered obvious by Deng and Hazelton '185. Accordingly, Claim 15 is believed to be allowable, and notice to that effect is respectfully requested.

Independent Claims 6, 9 and 20

Independent Claim 6 stands rejected under 35 U.S.C. §103 as obvious in view of a proposed combination of Hazelton '185 with Zhang U.S. Patent Application Publication No. 2005/0161644 and Amblard U.S. Patent No. 7,056,646. Independent Claim 9 stands rejected under 35 U.S.C. §103 as obvious in view of a proposed combination of Hazelton '185 with Lyons U.S. Patent No. 7,125,652 and the Amblard patent. Independent Claim 20 stands rejected under 35 U.S.C. §103 as obvious in view of a proposed combination of Hazelton '185 with Amblard. These three grounds of rejection are all respectfully traversed, for the following reasons. In the present application, Claim 6 includes a recitation of:

performing a light exposing operation on the wafer using  
an objective lens immersed in a first fluid containing surfactant;  
and

cleaning the objective lens after the light exposing  
operation using a second fluid having a higher surfactant  
concentration than the first fluid.

Claim 9 includes a recitation of:



performing a light exposing operation on the wafer using  
an objective lens immersed in a first fluid that does not contain  
surfactant; and  
cleaning the objective lens using a second fluid comprising  
a surfactant-spiked water immersion fluid.

Claim 20 includes a recitation of:

performing a light exposing operation on the wafer using  
an objective lens immersed in a first fluid; and  
cleaning the objective lens using a second fluid containing  
surfactant.

When evaluating obviousness under §103, it is not proper to selectively consider only part of a reference, while ignoring other parts that teach away from the claimed invention. For example, the provisions of MPEP §2141.02 specify that:

A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. (Emphasis in original).

As to the “cleaning” recited in each of Claims 6, 9 and 20, the Office Action admits that Hazelton '185 does not disclose the use of a liquid containing a surfactant, even when considered either with Zhang or with Lyons. Therefore, in each rejection, the Examiner turns to Amblard, and in particular relies on Amblard's disclosure of an immersion liquid that contains both a developer and a surfactant. However, the specific thrust of Amblard is that the disclosed immersion liquid is used only during immersion lithography, thereby improving the overall

efficiency of the immersion lithography process. Amblard repeatedly states that, after immersion lithography has been performed, the immersion lithography apparatus is not again exposed to a developer, and thus is not exposed to the developer-containing immersion liquid after immersion lithography has been performed. (For example, this is discussed by Amblard in lines 58-67 in column 1, lines 8-10 and 46-58 in column 2, lines 58-60 of column 7, and lines 47-50 of column 8). In the present Office Action, the Examiner asserts that Amblard's immersion liquid (containing a developer) could be used as a cleaning liquid, and in particular could be supplied into the immersion lithography arrangement for cleaning after a different immersion liquid is removed. However, Amblard explicitly teaches away from this, by repeatedly stating that "A developer is not contacted with the immersion lithography arrangement after the immersion lithography fluid is removed" (lines 58-60 of column 7, and lines 47-50 of column 8).

In the Office Action, the Examiner basically takes the position that he can "cherry pick" from Amblard the disclosure of a particular liquid, while ignoring other teachings in Amblard regarding that liquid. However, this approach is directly prohibited by MPEP §2141.02 which, as discussed above, specifies that Amblard "must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention".

In the text at lines 7-20 on page 20 of the Office Action, the Examiner asserts that Amblard "does not teach away, since Hazelton . . . does not criticize, discredit, or otherwise discourage using a developer . . . after immersion lithography fluid is removed". However, it is respectfully submitted that this assertion does not make sense, because the issue of whether Amblard teaches away depends solely on Amblard, and not on anything in Hazelton. Moreover, the Examiner admits that Hazelton is silent on this particular point, and Hazelton's silence does nothing at all to counteract the fact that Amblard does clearly teach away. Amblard strongly and repeatedly emphasizes that the liquid disclosed therein is an immersion liquid that is to be used only during immersion lithography and not afterward. A person of only ordinary skill in the art would have no motivation to use Amblard's immersion liquid in a manner directly contrary to

what is explicitly taught by Amblard. Therefore, and contrary to the assertions of the Examiner, the proposed combination involving Amblard would **not** be obvious.

Since it is well recognized that teaching away from a claimed invention is a per se demonstration of lack of prima facie obviousness, it is respectfully submitted that Hazelton '185 and Amblard do not factually support a prima facie case of obviousness under §103 with respect to any of Claims 6, 9 and 20, with or without regard to Zhang or Lyons. Accordingly, it is respectfully submitted that Claims 6, 9 and 20 are not obvious under §103 in view of Hazelton '185 and Amblard, considered with or without Zhang or Lyons. Notice to that effect is respectfully requested.

#### Dependent Claims

Claims 2-5 and 7-8, Claims 10-14, Claims 16-19 and Claims 21-27 respectively depend from Claim 6, Claim 9, Claim 15 and Claim 20, and are also believed to be patentable, for example for the same reasons discussed above in association with Claims 6, 9, 15 and 20, respectively.

#### Conclusion

Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

Appl. No. 10/802,087  
Reply to Office Action of April 7, 2010

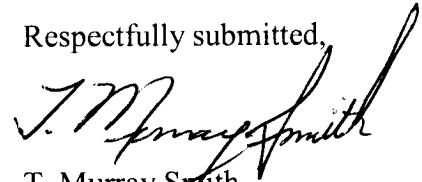
Attorney Docket No. 2003-1435 / 24061.911  
Customer No. 42717

Although Applicants believe that no additional fees are due, the Commissioner is hereby authorized to charge any fees required by this paper, or to credit any overpayment, to Deposit Account No. 08-1394 of Haynes and Boone, LLP.

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Enclosures: None

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